Interactions between hatchery and naturally produced Chinook on the spawning grounds in the Greater Lake Washington Basin

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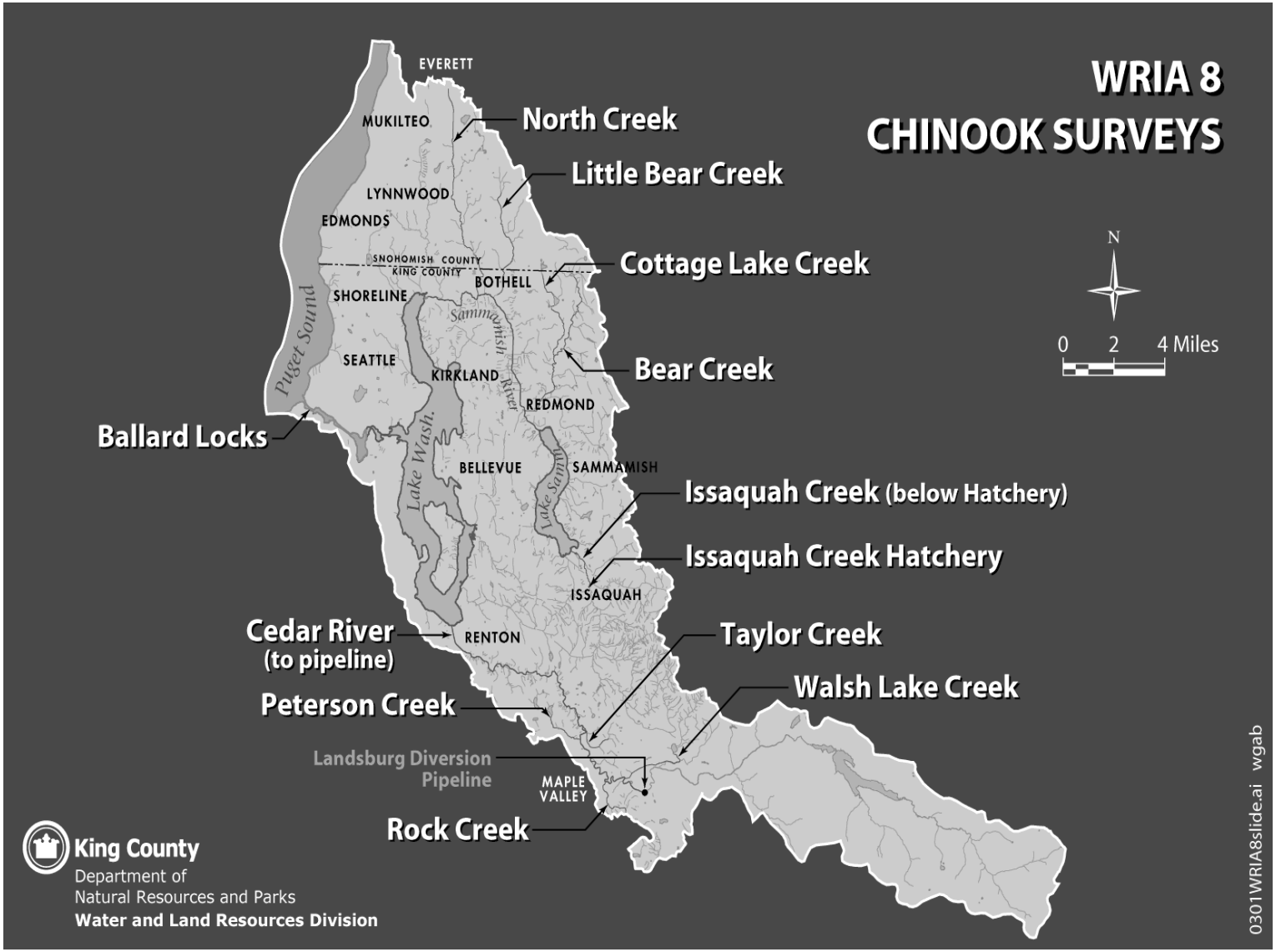
Objectives

1. Understand basic population characteristics of adult Chinook (*Oncorhynchus tshawytscha*) in WRIA 8 streams (*size*, *age*, *sex ratio*)

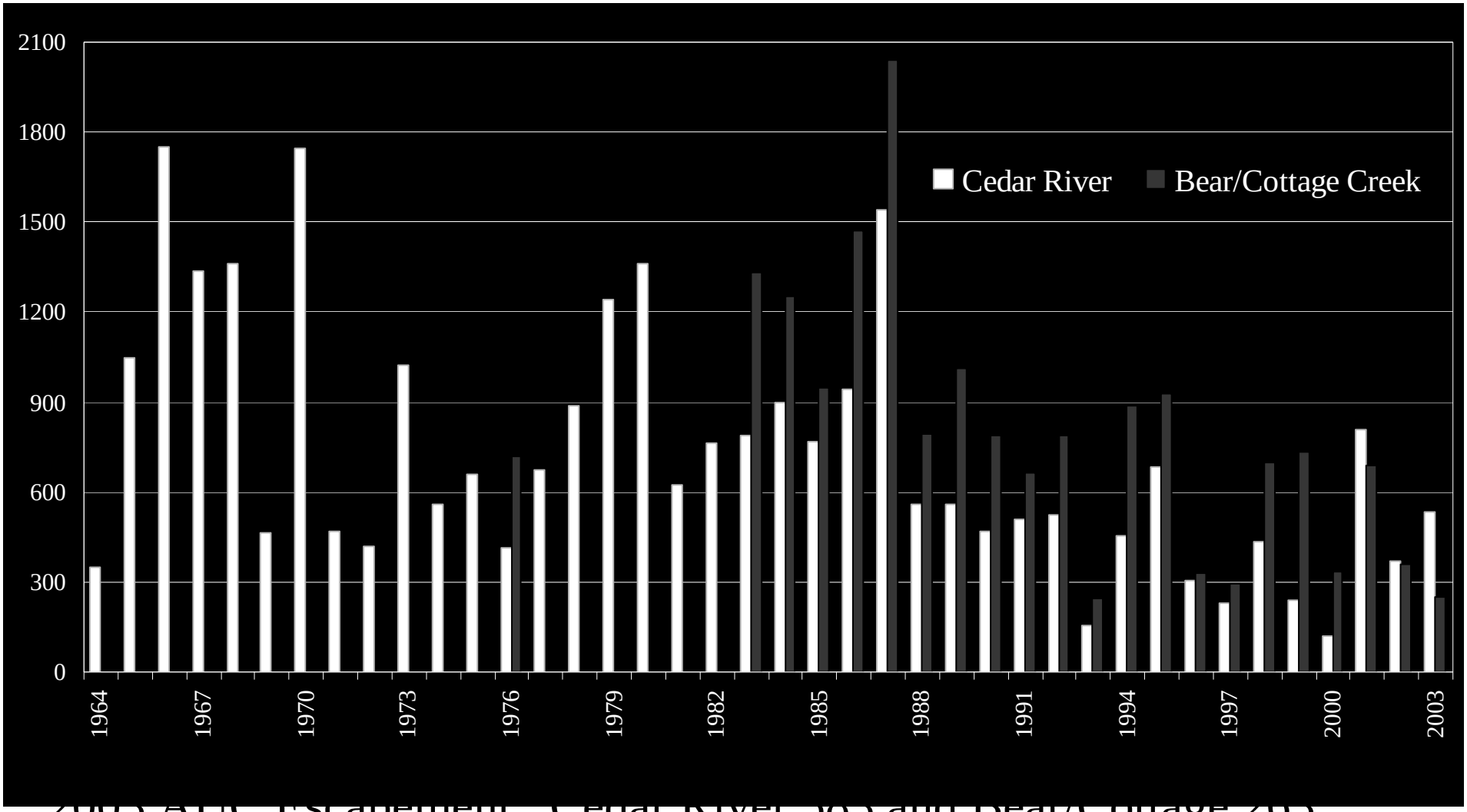
2. Evaluate spawning success of female Chinook using biological characteristics (*% un-spawned*)

3. Monitor the proportion of hatchery marked Chinook spawning in the natural environment (*% ad-clipped and CWT recoveries*)

Study Area


WRIA 8
CHINOOK SURVEYS
N
0 2 4 Miles
EVERETT
MUKILTEO
LYNNWOOD
EDMONDS
SNOHOMISH COUNTY
KING COUNTY
BOTHELL
SHORELINE
SEATTLE
KIRKLAND
REDMOND
BELLEVUE
SAMMAMISH
ISSAQUAH
RENTON
MAPLE VALLEY
Puget Sound
Lake Wash.
Sammamish River
Lake Sammamish
North Creek
Little Bear Creek
Cottage Lake Creek
Bear Creek
Ballard Locks
Issaquah Creek (below Hatchery)
Issaquah Creek Hatchery
Taylor Creek
Walsh Lake Creek
Cedar River (to pipeline)
Peterson Creek
Landsburg Diversion Pipeline
Rock Creek
King County
Department of
Natural Resources and Parks
Water and Land Resources Division
0301WRIA8slide.ai wgab

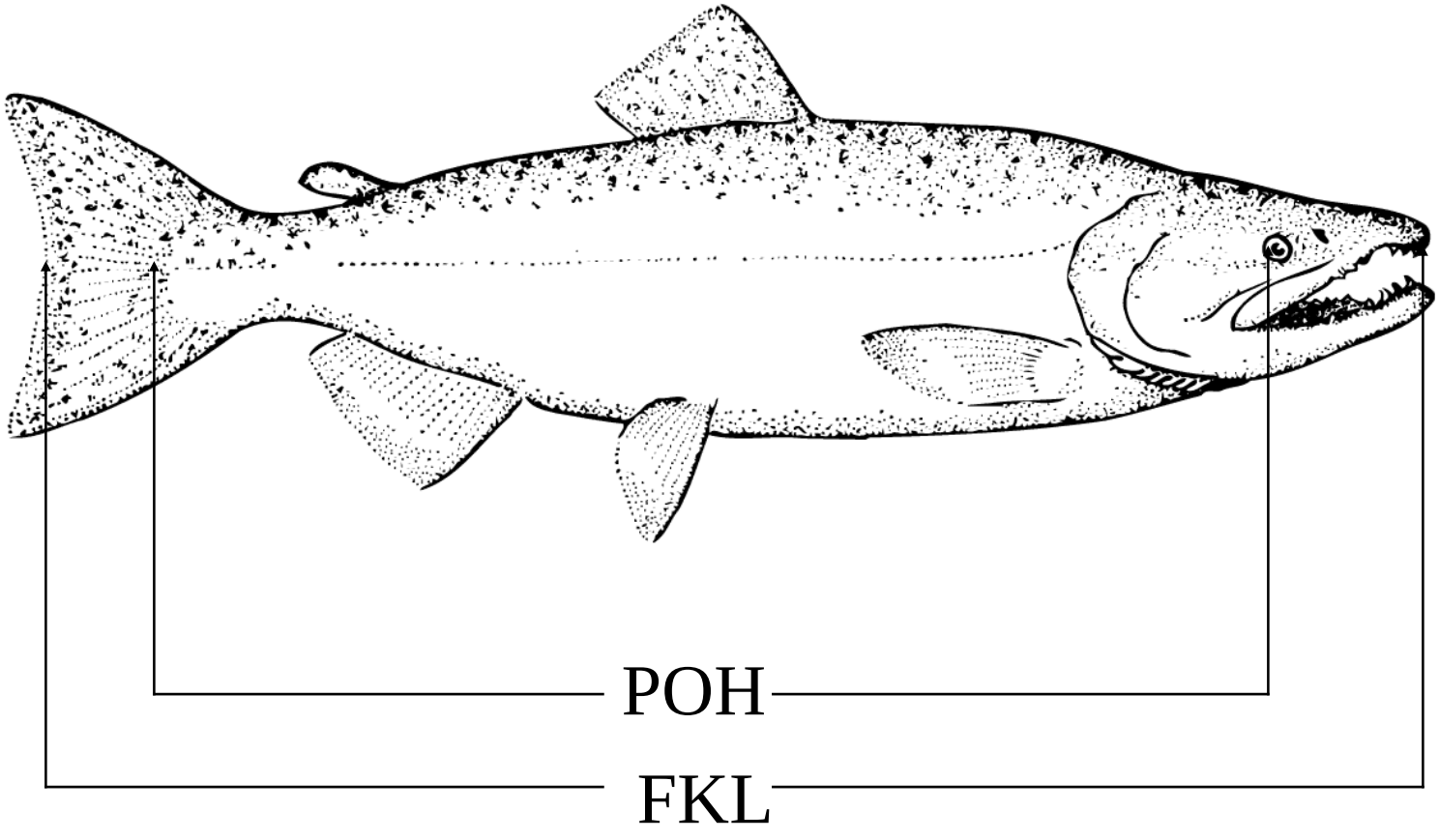
Chinook Escapement in the Cedar River and Bear/Cottage Creeks (1964-2003)



2003 AUC Escapement: Cedar River 583 and Bear/Cottage 263

Size

Record POH and FKL lengths on all carcasses to the nearest centimeter



Age

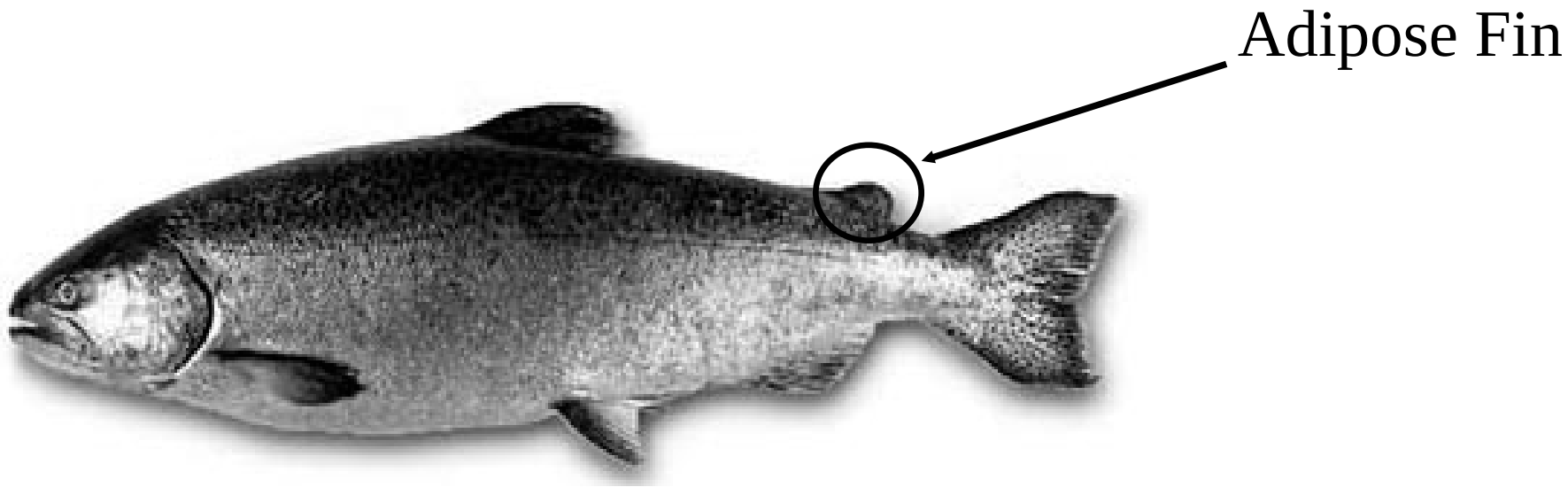
Collect scales from carcasses to determine age

Spawning Success

Sample females to determine percent “un-spawned” and record to nearest quartile

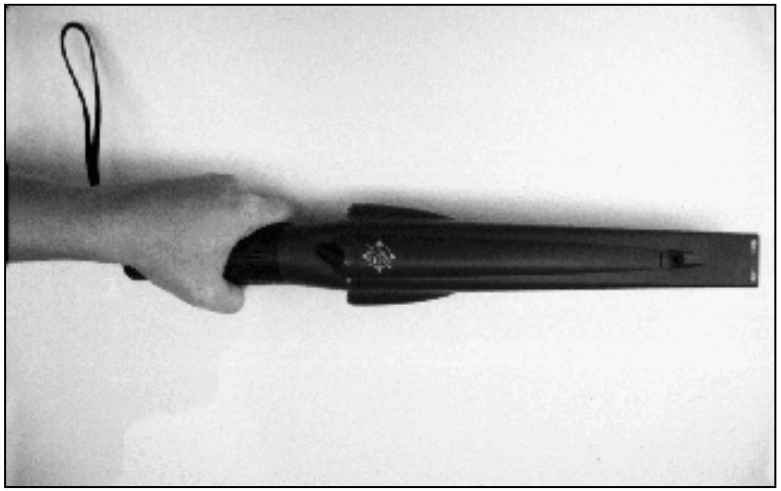
Hatchery Stray Rate

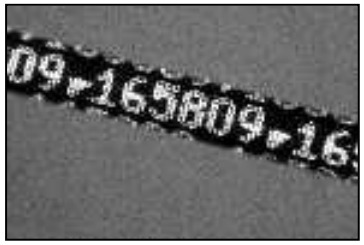
Sample carcasses for presence/absence of adipose fin



Spatial Extent of Straying

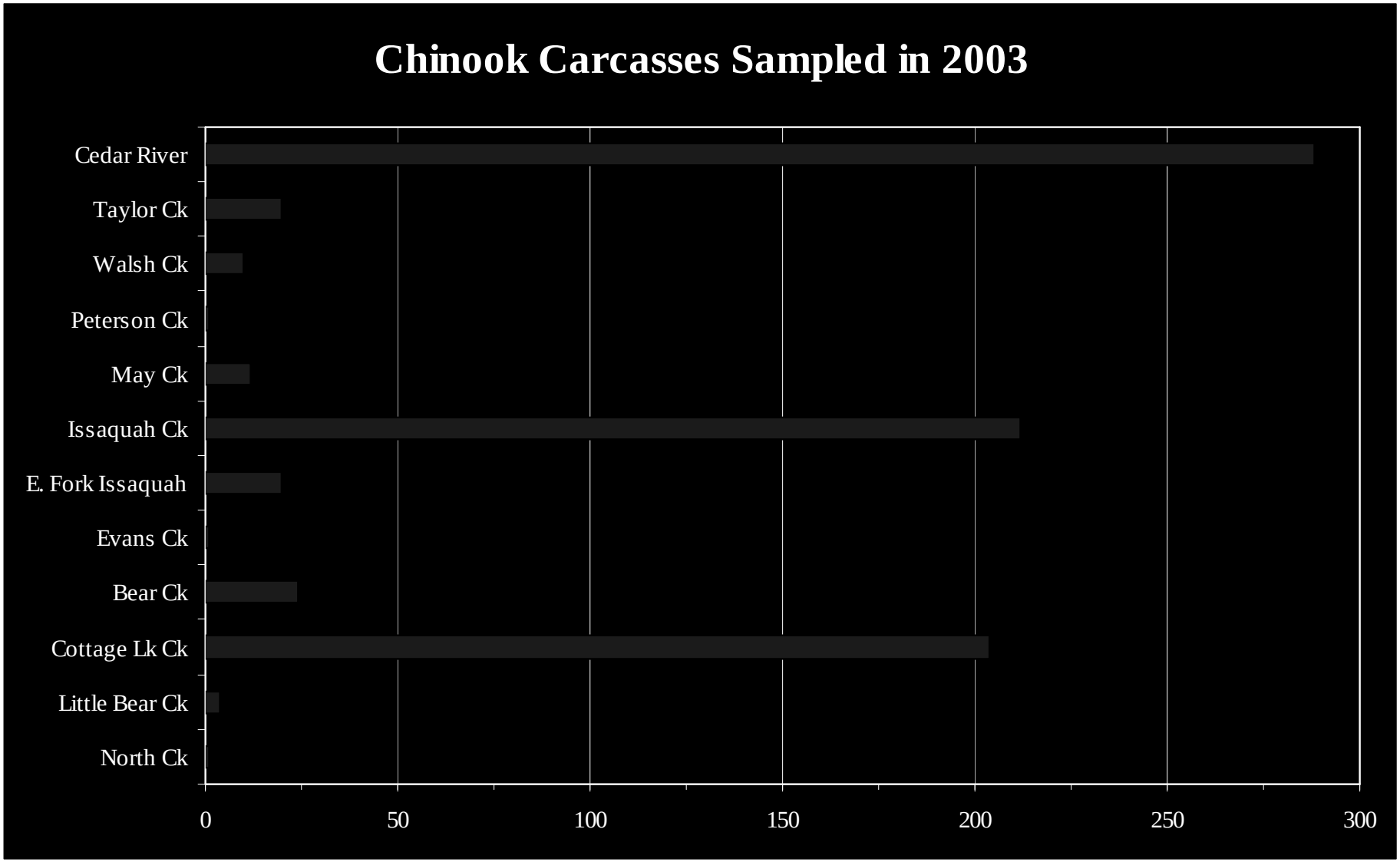
Sample carcasses for presence/absence of CWT





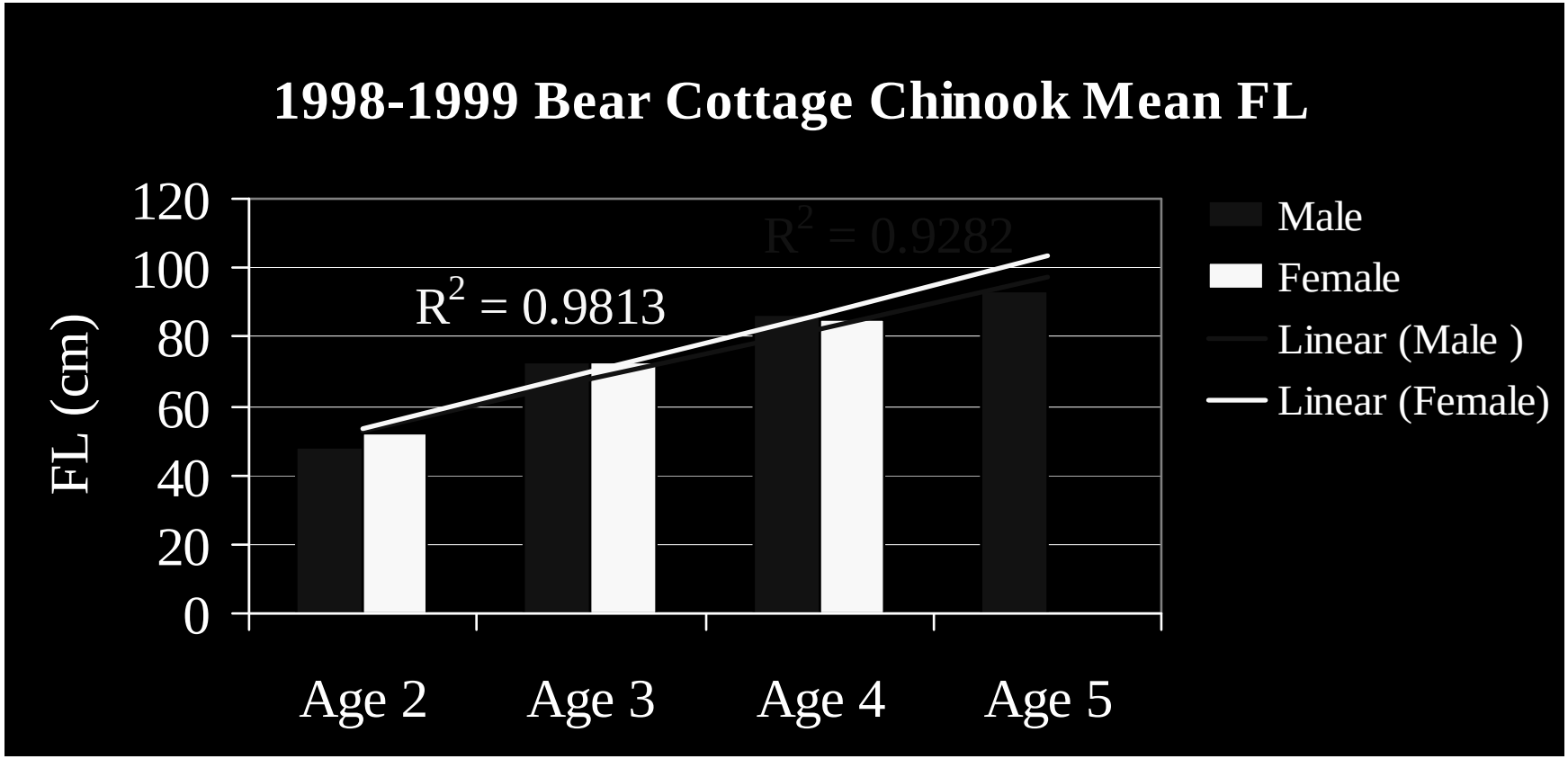
Photos from NMT website: http://www.nmt-inc.com

Results

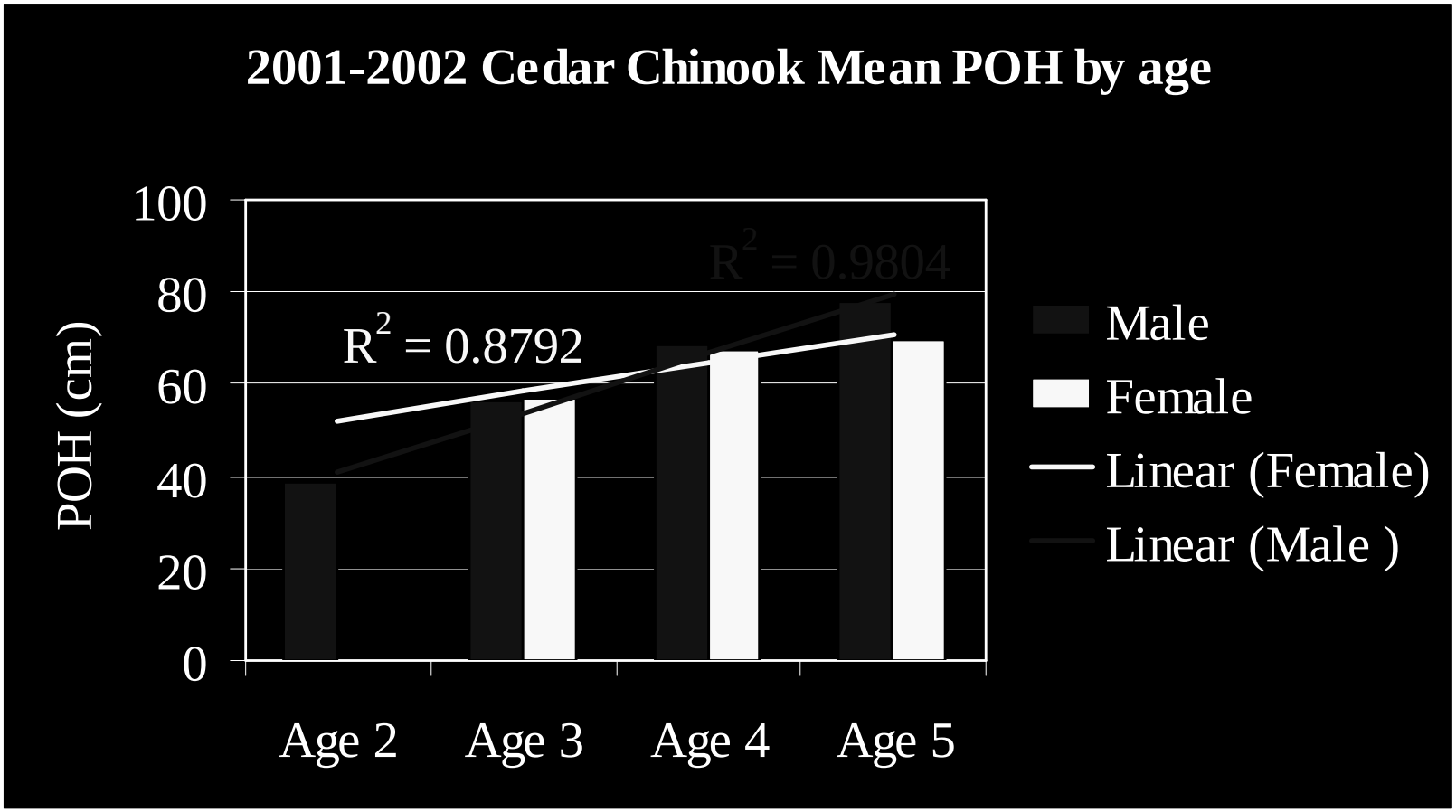

Chinook Carcasses Sampled in 2003
Cedar River
Taylor Ck
Walsh Ck
Peterson Ck
May Ck
Issaquah Ck
E. Fork Issaquah
Evans Ck
Bear Ck
Cottage Lk Ck
Little Bear Ck
North Ck
0
50
100
150
200
250
300

Results: Age Data Bear/Cottage

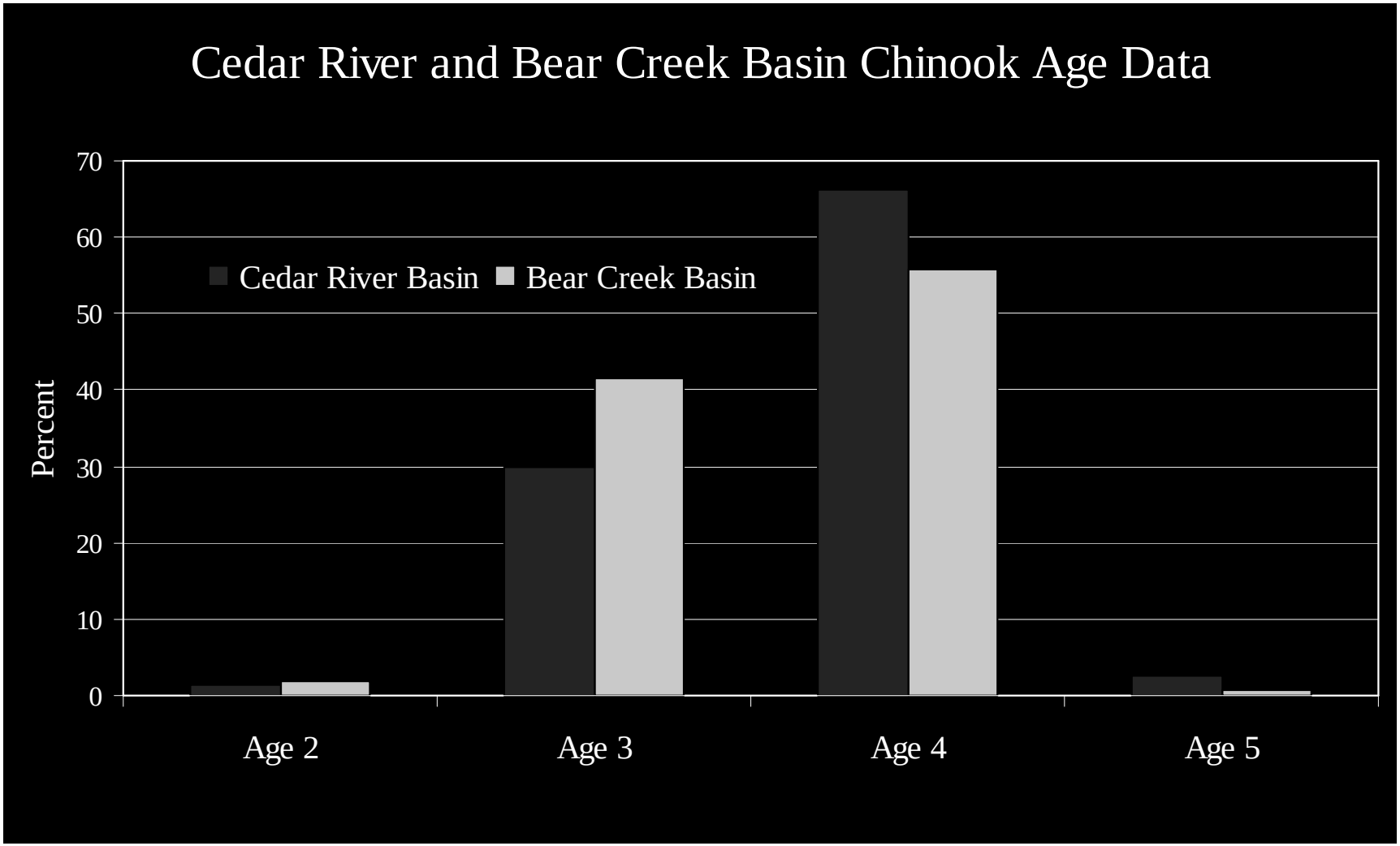
2003 age data is not available at this time



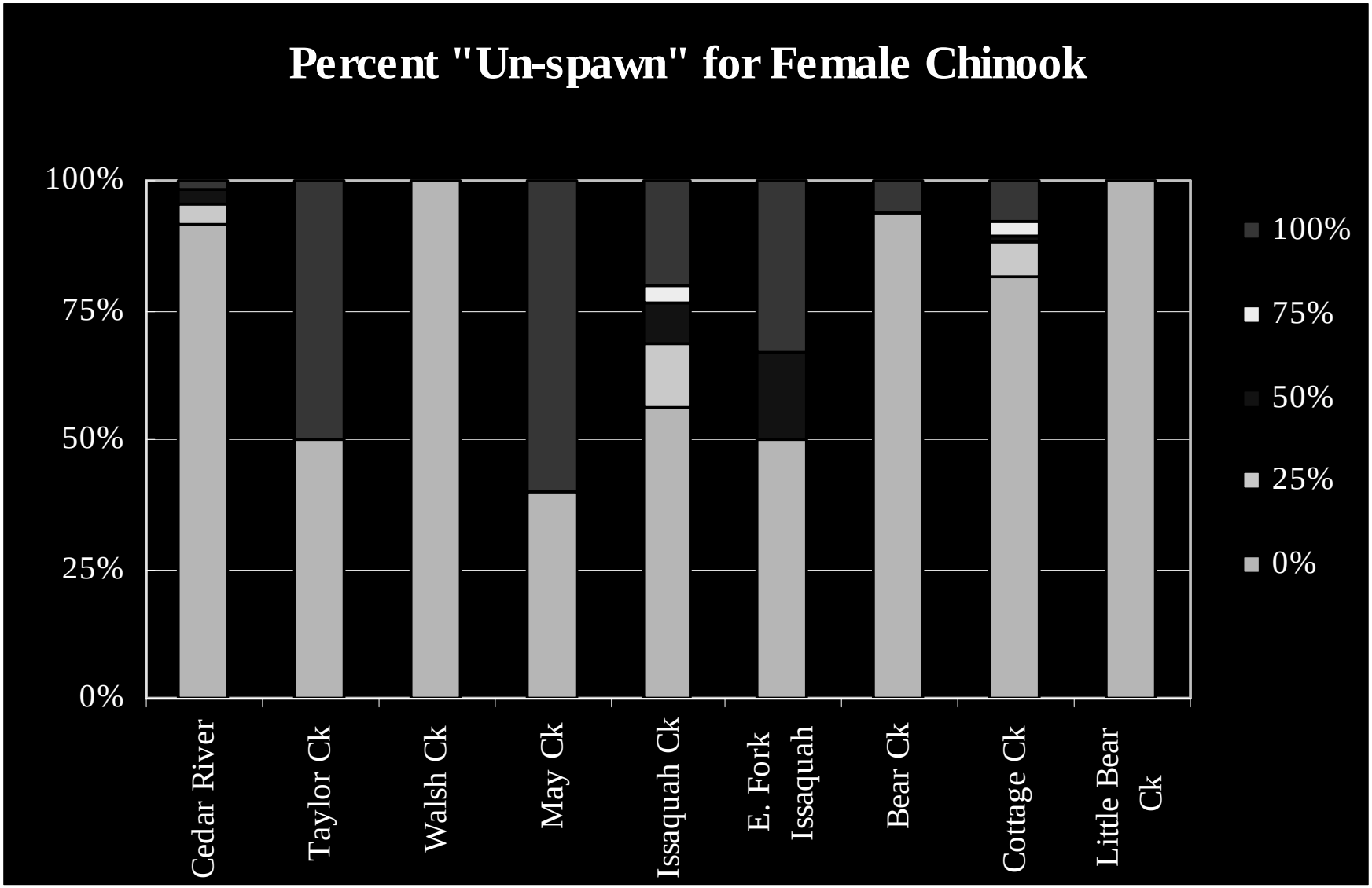
Results: Age Data Cedar River



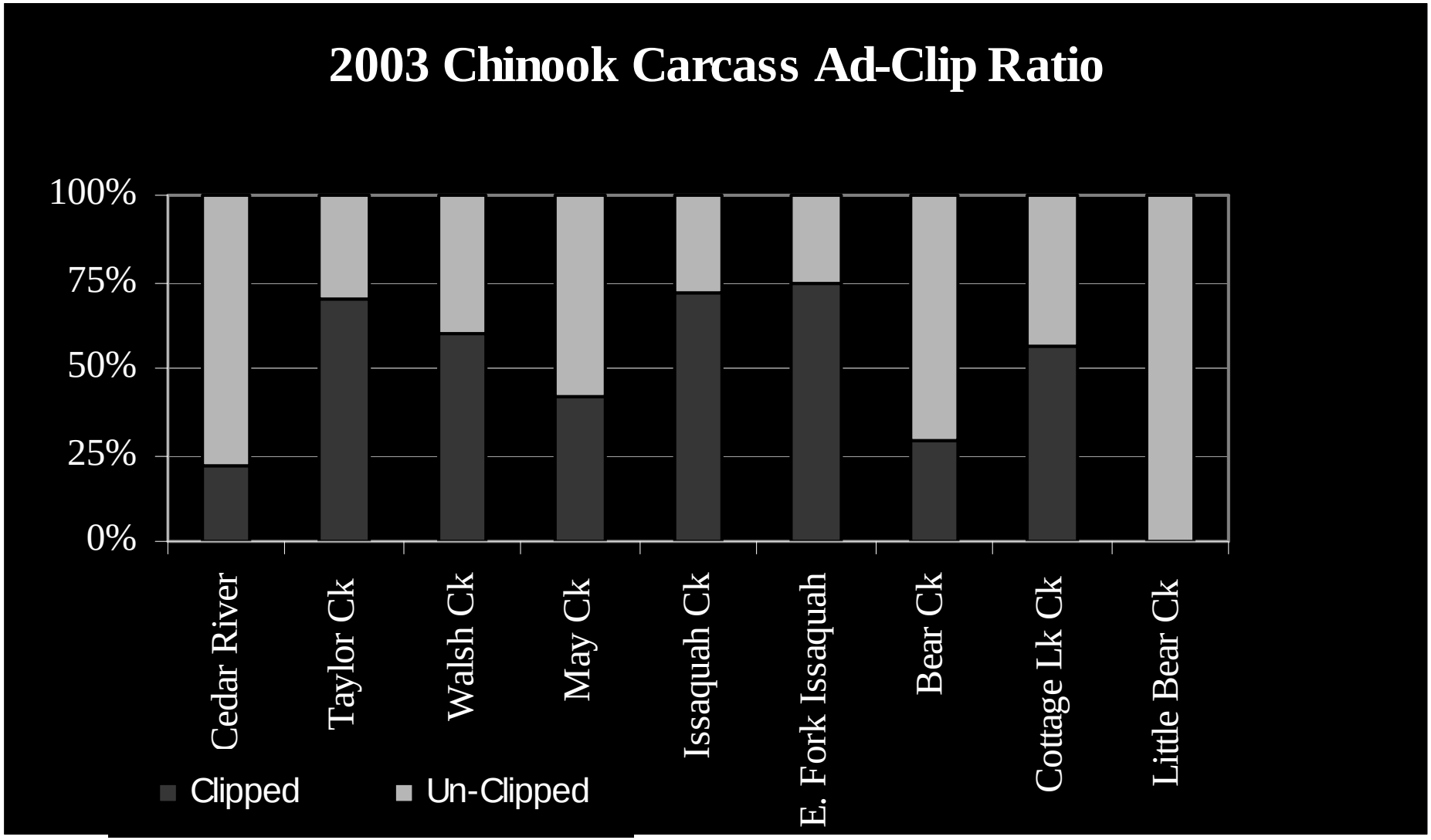
Results: Combined Age Data



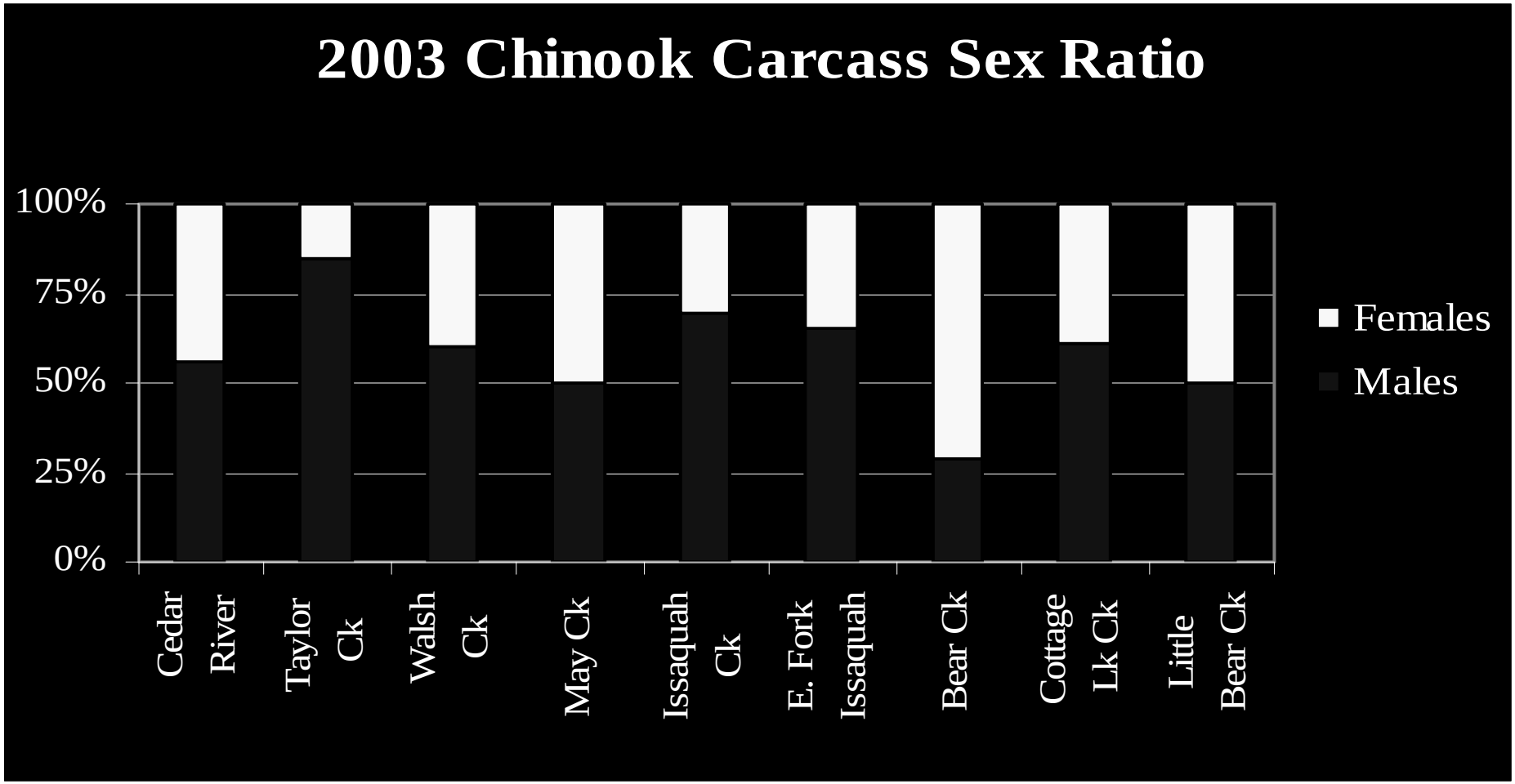
Results: Spawning Success



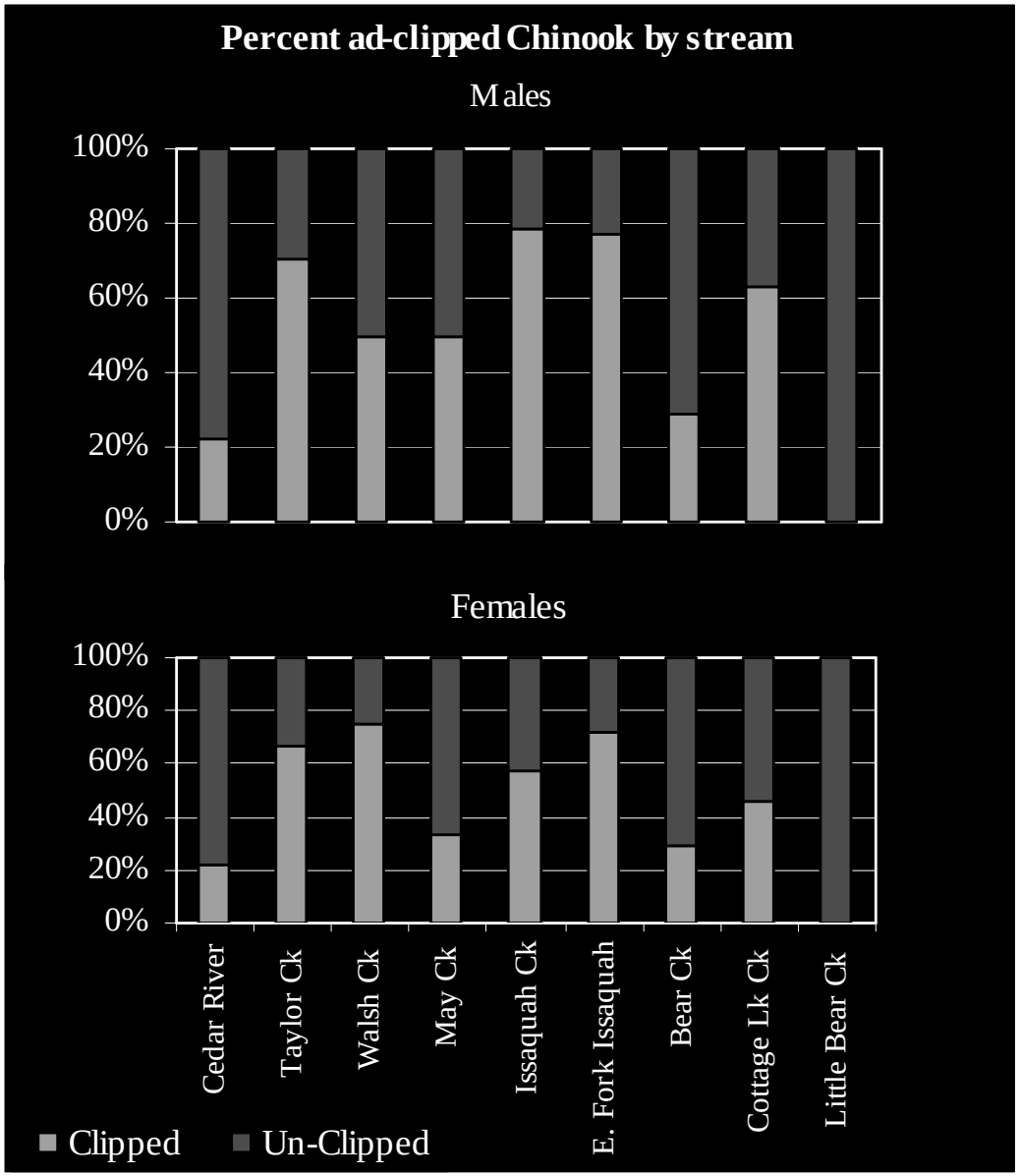
Results: Ad-clipped Fish



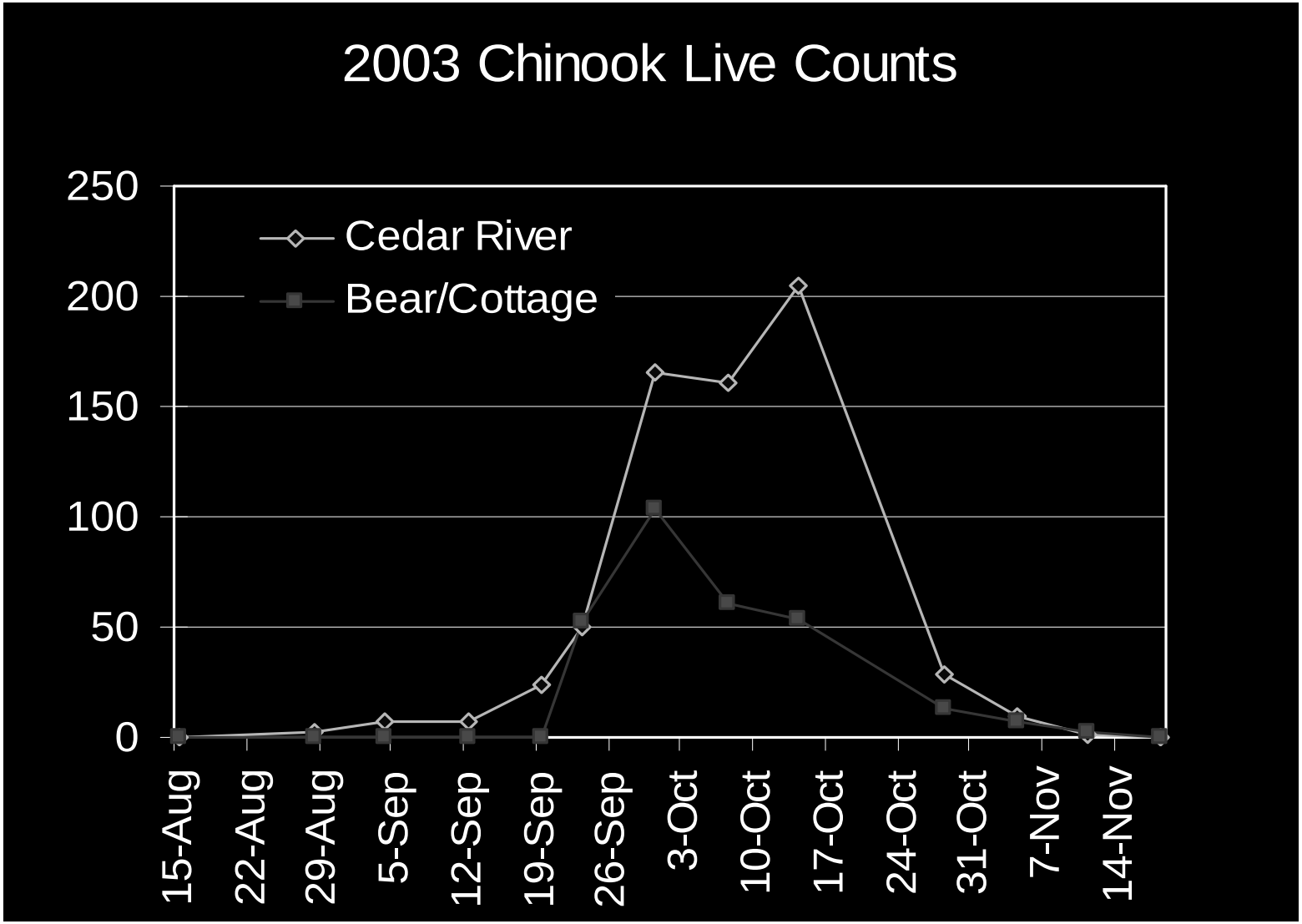
Results: Sex Ratio



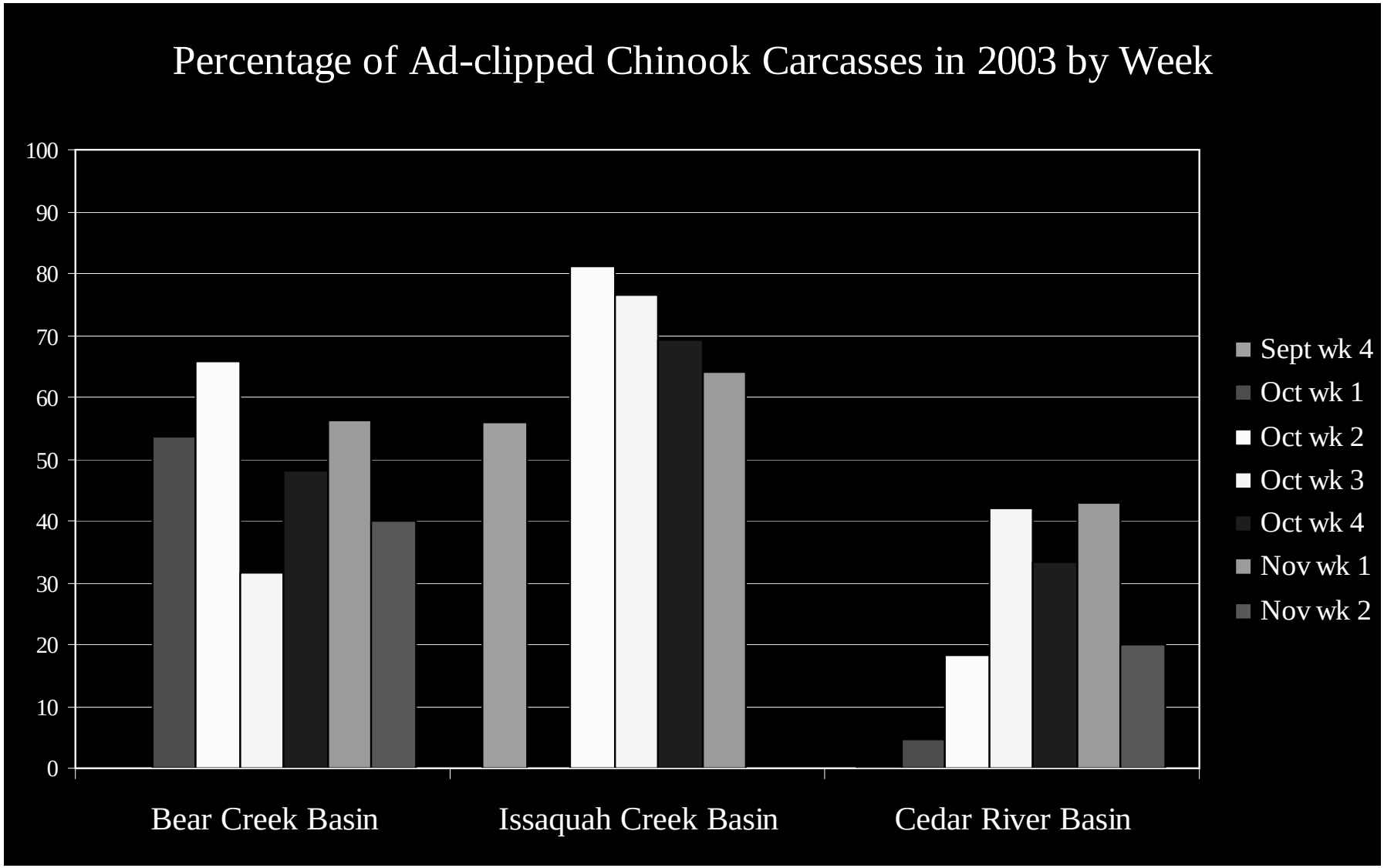
Results: Ad-clipped By Sex



Results: Peak Spawning



Results: Ad-clipped Percentage by Week



Results: CWT Recoveries

8 CWTs from the Cedar River

- 3 Grover's Creek Hatchery (un-clipped fish)
- 5 UW Hatchery

2 from Taylor Creek

- 2 UW Hatchery

2 from Walsh Creek

- 2 UW Hatchery

4 from the Bear Creek Basin

- 2 Grover's Creek Hatchery
- 2 UW Hatchery

2 from Issaquah Creek

- 1 Grover's Creek Hatchery
- 1 Issaquah Creek Hatchery

Summary

- PSM affects hatchery and wild fish alike

- The absolute rate of PSM is lowest in the Cedar River Basin, and highest in the Issaquah Creek Basin

- In 2003 we found a significant contribution of hatchery origin chinook on the spawning grounds in WRIA 8

- Hatchery component in 2003 is higher than we expected

- A higher proportion of males are hatchery origin

Summary cont'd

- The hatchery fish seem to arrive during the peak of the run
- The Cedar River Basin has the lowest proportion of hatchery in WRIA 8
- CWT recoveries suggest that straying is occurring from the UW, Grover's Creek, and Issaquah Creek Hatcheries
- We were surprised that we didn't recover any Soos Creek Hatchery Chinook

Discussion

- Life History Traits
  - -Important to understand the life-history diversity of naturally produced Chinook
- Hatchery vs. “Wild” Interactions
  - -We need to look at direct effects of hatchery produced adults on the spawning grounds
  - -Now that hatchery fish are marked, spawning ground surveys can aid in a better understanding of the complex interactions between hatchery and wild Chinook
  - -Target research questions to Chinook of known origin
- Spawning Success
  - -Important to track fish kills that may be less obvious
  - -May help explain potential “sink” areas

Future Work

- Aging analysis needs to be finished; report available by June 2004
- Funding secured through 2004 for fish counts and redd and carcass surveys
- We will continue biological sampling for age, sex ratios, CWTs, and spawning success

Acknowledgments

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WDFW Staff

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